

What is claimed is:

1. An extruding method comprising:

(a) providing a casting surface and a condensing surface spaced from said casting surface

to form a gap between said casting surface and said condensing surface;

(b) extruding a material onto said casting surface, said material capable of forming

microporous films by thermally induced phase separation, said material having at least one evaporative component upon formation of said microporous film;

(c) moving said casting surface in a direction relative to said condensing surface in order to move the material through said gap; and

(d) maintaining a condensing surface temperature to condense at least a portion of said at least one evaporative component on said condensing surface.

2. The method of claim 1, further comprising adjusting said gap to control the rate of condensation of said at least one evaporative component.

3. The method of claim 1, wherein said material is extruded onto said casting surface at temperature higher than a temperature of said casting surface

4. The method according to claim 1, wherein the casting surface is provided on a roll, belt or wheel, and moving said casting surface includes rotating said roll, belt or wheel.

5. The method according to claim 1, wherein said gap or said condensing surface temperature are adjusted to vary an condensation rate of said at least one evaporative component.

6. The method according to claim 1, wherein the material includes a thermoplastic polymer, a diluent, and a nucleating agent.

7. The method according to claim 1, further comprising removing the condensate from said condensing surface while said condensate remains in a liquid state.

8. The method according to claim 1, wherein said condensing surface comprises a capillary surface.

9. The method according to claim 1, wherein said condensing surface has a trailing end relative to the motion of the casting surface, and an exhaust passageway is provided adjacent the trailing end, the method further comprising capturing exhaust exiting the gap through the exhaust passageway.

10. The method according to claim 1, further comprising pinning said material to said casting surface after extruding said material.

11. The method according to claim 10, wherein said pinning is accomplished with an electrically charged wire.

12. The method according to claim 11, wherein the condensing surface comprises two condensing surface portions separated by a slot exposing said material to an electrical field from the electrically charged wire.

13. The method according to claim 12, further comprising flowing gas past the electrically charged wire to reduce concentration of evaporative components in the vicinity of the electrically charged wire.

14. The method according to claim 1, wherein the step of extruding material onto a casting surface further comprises forming a web on the casting surface.

15. The method of claim 1, further comprising controlling casting surface temperature, material temperature, or combinations thereof to adjust an evaporation rate of said evaporative component.

16. A casting method comprising:

- (a) providing a casting surface and a condensing surface spaced from said casting surface to form a gap between said casting surface and said condensing surface;
- (b) casting a material onto said casting surface, said material capable of forming microporous films by thermally induced phase separation, said material having at least one evaporative component upon formation of said microporous film;
- (c) moving said casting surface in a direction relative to said condensing surface in order to move the material through said gap; and
- (d) maintaining a condensing surface temperature to condense at least a portion of said at least one evaporative component on said condensing surface.

17. A method according to claim 16, wherein casting is accomplished through extrusion.

18. An apparatus for forming microporous films, comprising:

- (a) a casting surface, suitable for receiving a cast material, said material capable of forming microporous films by thermally induced phase separation, said material having at least one evaporative component upon formation of said microporous film; and
- (b) a condensing surface spaced from said casting surface to form a gap between said casting surface and said condensing surface, said casting surface capable of moving in a direction relative to said condensing surface in order to move material through said gap, said condensing surface maintained at a temperature to condense at least a portion of said at least one evaporative component on said condensing surface.

19. The apparatus according to claim 18, wherein the casting surface is provided on a roll, belt or wheel, and moving said casting surface includes rotating said roll, belt or wheel.

20. The apparatus according to claim 18, wherein said gap is adjustable.

21. The apparatus according to claim 18, wherein said material is extruded onto said casting surface at temperature higher than a temperature of said casting surface.

22. The apparatus according to claim 18, wherein said gap or said condensing surface temperature are adjusted to vary an evaporation rate of said at least one evaporative component.

5 23. The apparatus of claim 18, wherein the material includes a thermoplastic polymer, a diluent, and a nucleating agent.

10 24. The apparatus according to claim 18, further comprising a mechanism for removing the condensate from said condensing surface while said condensate remains in a liquid state.

15 25. The apparatus according to claim 24, wherein said condensing surface comprises a capillary surface.

20 26. The apparatus according to claim 18, wherein said condensing surface has a trailing end relative to the motion of the casting surface, and an exhaust passageway is provided adjacent the trailing end.

25 27. The apparatus according to claim 18, further comprising a pinning wire to pin said material to said casting surface.

30 28. The apparatus according to claim 27, wherein the condensing surface comprises two condensing surface portions separated by a slot exposing said material to an electrical field from the pinning wire.

35 29. The apparatus according to claim 28, further comprising flowing gas past the electrically charged wire to reduce concentration of evaporative components in the vicinity of the pinning wire.

40 30. A method for preventing contamination of a pinning wire, comprising flowing gas past the pinning wire to reduce concentration of evaporative components in the vicinity of the pinning wire.